

Workgroup Consultation Response Proforma

GC0137: Minimum Specification Required for Provision of GB Grid Forming (GBGF) Capability (formerly Virtual Synchronous Machine/VSM Capability)

Industry parties are invited to respond to this consultation expressing their views and supplying the rationale for those views, particularly in respect of any specific questions detailed below.

Please send your responses to grid.code@nationalgrideso.com by 5pm on **30 April 2021**. Please note that any responses received after the deadline or sent to a different email address may not receive due consideration by the Workgroup.

If you have any queries on the content of this consultation, please contact Kavita Patel Kavita.patel@nationalgrideso.com or grid.code@nationalgrideso.com

Respondent details	Please enter your details
Respondent name:	Stephan Wachtel
Company name:	GE Renewable Energy
Email address:	stephan.wachtel@ge.com
Phone number:	+49-1520-9061219

For reference the Applicable Grid Code Objectives are:

- a) *To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity*
- b) *Facilitating effective competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity);*
- c) *Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole;*
- d) *To efficiently discharge the obligations imposed upon the licensee by this license and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and*
- e) *To promote efficiency in the implementation and administration of the Grid Code arrangements*

Please express your views regarding the Workgroup Consultation in the right-hand side of the table below, including your rationale.

Standard Workgroup Consultation questions		
1	Do you believe that the GC0141 Original	No, we do not think so. The developed draft is much more specific and comprehensive.

	Proposal better facilitates the Applicable Objectives?	
2	Do you support the proposed implementation approach?	<p>In general, we support the approach, especially the proposed non-mandatory requirements & service approach in this early phase of grid forming requirements in grid codes and technology development.</p> <p>Please also notice the provided comments, questions and Alternative Requests.</p>
3	Do you have any other comments?	<p>Please find our comments and questions below.</p> <p>On the Glossary - Definition of Voltage Jump Reactive Power: The definition of this parameter includes a dynamic requirement requesting instantaneous supply of voltage jump reactive power as a result of a voltage magnitude change. Background and intention of this dynamic requirement is unfortunately not fully clear. For other parameters like e.g. phase jump active power, dynamics are defined in the quite clear way that a response should start within less than 5 milliseconds. It is unfortunately unclear why is this kind of specification was not used for the voltage jump reactive power and a quantitative dynamic requirement would be appreciated.</p> <p>On the Glossary – Definition of Control Based in conjunction with ECP.A.3.9.6: The draft in conjunction with the provided guidance document provide quite clear information that a 5 Hz control bandwidth requirement shall be applied. Unfortunately, the draft does not provide details on quantitative acceptance criteria for meeting this requirement. It would be an important improvement and help to understand the tolerance around the 5 Hz control bandwidth limitation more clearly.</p> <p>On ECC.6.3.19.3 (vi): In general, the entire draft includes a lot of well-defined quantitative requirements. Unfortunately, the damping requirements for the active power output and reactive power output following a</p>

disturbance just refer to the term “adequately damped” without giving a clear definition what “adequately damped” shall quantitatively mean (e. g. minimum damping ratio). In general, we would appreciate if this ambiguity could be eliminated, but maybe there is some background information available why just the term “adequately damped” was used in this clause and not specified more in detail.

On ECC.6.3.19.3 (viii):

From reading this clause and the draft requirements in general it is not fully clear if the model structure shown in Figure 3.0 labeled “Typical Simulation Model” is

- a) the only one that shall become acceptable and must be supported by any technology or
- b) if this is an example and users / vendors have flexibility for providing an equivalent model of their Grid Forming Plant.

Some clarification on this item would be appreciated. In general, we would like to strongly recommend keeping model structures in this early phase of grid forming technology implementation as open and flexible as possible.

On Appendix ECP.A.3.9.

The Appendix provides an outline about the compliance process but unfortunately does not include detailed information on a) how simulation and/or measurement results shall be assessed and on b) acceptance criteria. Assessing simulation and/or measurement results should be carefully considered as the performance parameters to be checked (“within less than 5 ms”) fall within the same time domain as a lot of other transient phenomena creating noise around the data of interest under assessment (switching transients, DC offsets, harmonics , etc.). And for acceptance criteria it can make a significant difference if performance and compliance get evaluated by assessing 1ms (“instantaneous”) values or RMS values (over 20ms) or floating 50ms average values, etc.

		Some information on how and when details on a) and b) shall be developed more in detail and published would be very helpful.
4	Do you wish to raise a Workgroup Consultation Alternative Request for the Workgroup to consider?	Yes, please find Workgroup Consultation Alternative Requests submitted together with this response.
Modification Specific Workgroup Consultation questions		
5	Do you believe it is appropriate specify GB Grid Forming as a non-mandatory requirement in the Grid Code and be accessed by future market arrangements rather than as a mandatory requirement?	Yes, we regard this implementation in this early phase of grid forming requirements in grid codes and technology development path as very positive.
6	Do you believe the current proposal is sufficiently flexible and facilitates a range of technologies? If not, please state why you feel this to be the case and what type of technologies have been excluded?	We still see potential for more flexibility for the proposed services / required capabilities. I.e. it can make a difference if a grid forming plant shall be also capable to serve an islanded part of the grid completely on its own or in connection with other generation plants. Please also refer to the submitted Workgroup Consultation Alternative Requests.
7	Do you believe the proposal will result in excessive equipment costs? This excludes development costs whilst recognising plant can be also be de-loaded?	The additional grid forming capabilities will do impact the costs of wind energy. A more detailed response could be provided if e.g., but not limited when more information on the method of delivery and other service / product related details are available.
8	Do you believe the proposed Grid Code proposals sit better in the Planning Code, Connection Conditions / European Connection Conditions and Compliance Processes / European Compliance Processes bearing in mind the proposals are non-mandatory or do you think it would be better to have a new standalone section	As the new services related closely to the Connection Conditions et. al. and a lot of references are part of the proposal, we think that these new non-mandatory requirements sit well in this section.

